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**TRENDS AND METHODS IN IDENTIFICATION OF
HUMAN IMMUNODEFICIENCY VIRUS (HIV) SEROPOSITIVITY
IN ACTIVE-DUTY U.S. NAVY ENLISTED PERSONNEL:
1986-1989**

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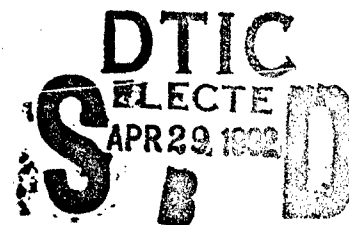
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Trends and Methods in Identification of Human Immunodeficiency Virus (HIV) Seropositivity in Active-Duty U.S. Navy Enlisted Personnel: 1986-1989

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Time-trends in the occurrence of HIV seropositivity are the basis for projecting the future course of the epidemic. This study presents quarterly rates of HIV infection during 1986 to 1989 in U.S. Navy active-duty enlisted personnel, a large, serially-tested population. During this period, the U.S. Navy administered 1,795,578 enzyme-linked immunosorbent assay (ELISA) tests to 848,632 active-duty Navy enlisted personnel. There were 2,438 seropositive personnel identified, including 778 with a previous negative test. Three types of quarterly rates are reported here: the seropositive rate per 1,000 tested; the seroconversion rate per 1,000 tested (with a previous negative test); and the seroconversion rate per 1,000 person-years. Rates by all three methods declined between 1986 and 1989. The mean seropositive rate per 1,000 tested showed a steady decline from 2.9 in 1986 to 0.5 in 1989 ($p < 0.05$). The mean age-adjusted seroconversion rate per 1,000 tested declined from 3.4 in 1986 to 0.5 in 1989 ($p < 0.05$). The mean seroconversion rate per 1,000 person-years declined from 0.9 in 1986 to 0.4 in 1989 ($p < 0.05$). The race ratio (black/white) declined from 3.9 to 2.7 over the same time-period. Mean seroconversion rates among male hospital corpsmen declined from 10.3 in 1986 to 1.5 in 1989 ($p < 0.05$). The overall decline in HIV rates in the Navy could not be explained by changes in the population tested according to age, race, sex, occupational risk group, or geographic location of home port during the study period. The decline in rates in the Navy is encouraging. The trend may reflect a pattern imposed on this population by rigorous testing and exclusion of HIV seropositive individuals from entrance into service. Despite the decline in seroconversion, the majority of AIDS cases in the Navy may yet occur.

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It is estimated that 1.5 to 2 million Americans (1) and 5 to 10 million individuals worldwide (2) are infected with the human immunodeficiency virus type I (HIV). HIV infection is associated with AIDS (3,4) and first appeared in the U.S. blood supply in 1978 (5-7). Since this time there have been descriptions of the course of the epidemic in populations of homosexual and bisexual men (8-12), prisoners (13-16), and military recruits (17). Uncertainty about the future dimensions of the HIV epidemic has led to attempts to estimate trends in incidence in the general population (18-20). This study reports time trends in HIV seropositivity in a large, serially-tested population, the active-duty enlisted United States Navy.

Between January 1, 1986, when Navy-wide testing for HIV seropositivity began (21-25), and December 31, 1989, the Navy administered 1,795,578 enzyme-linked immunosorbent assays (ELISA) to 848,632 active-duty enlisted Navy personnel. In addition, since late 1985 all applicants for Navy service have been tested for the presence of antibodies to HIV (26-28). Those testing positive were not allowed to enter the Navy (26-28).

HIV seroconversion rates for the combined period 1986-1988 have been reported for the Navy (0.70 per 1,000 person-years) and for the Marine Corps (0.27 per 1,000 person-years) (21). The Navy rates were close to those reported for the Army for a similar time-period (0.77 per 1,000 person-years) (30). The prevalence rate of HIV seropositivity among military applicants in 1985-1988 was approximately 1.4 per 1,000 (31-32).

Methods

ELISA testing and Western Blot confirmation.

The Naval Health Research Center in San Diego, California, maintains computerized files for all persons in the Navy who received ELISA tests for the presence of antibodies to HIV and for confirmed HIV-seropositive persons identified from all sources of testing, including service-wide, blood donor, and clinic screening programs.

Navy service-wide testing began in the first quarter of 1986. Many individuals had several tests during 1986-1989

as a result of routine screening, testing of personnel serving in units deployable overseas, or testing of health care providers (21). Retesting allowed identification of seroconverters, i.e., persons with an initial negative test followed by a positive test.

During 1986-1989, rosters were completed for individuals tested at 27 medical treatment facilities that performed ELISA tests. Names, identification numbers, and dates of birth of persons receiving tests were provided to the Naval Health Research Center (and to the Reportable Disease Database [RDDDB] of the Defense Eligibility Enrollment Reporting System, Monterey, California), by North American Biologicals, Inc., which performed the tests. Identifying information was matched against the Naval Health Research Center Career History File for verification of identity and to obtain demographic information. This file contains detailed individual demographic and service history information obtained from the Naval Military Personnel Command, in Washington DC.

Records of all HIV seropositive personnel were entered into the HIV Central Registry at the Naval Health Research Center. Before entry into the registry, all seropositive individuals were confirmed by the Bureau of Medicine and Surgery and the Naval Health Research Center as having had two positive paired ELISA tests (from the same blood collection) followed by at least one positive Western blot assay. ELISA testing for HIV-I antibody in serum or plasma was done using a human T-cell lymphotropic virus type III (HIV-I) enzyme-linked immunosorbent assay test kit (Abbott Laboratories, North Chicago IL) from January to November, 1986; and a human T-cell lymphotropic virus type III (HIV-I) ELISA test kit (Virgo Electro-Nucleonics, Columbia MD) from December 1986 to December 1989. The criterion for a positive Western blot assay (Biotech Research Laboratories, Rockville MD) was a specimen that exhibited at least two of three bands at p24, gp41, and gp120/160. Since May 1987, a recombinant DNA enzyme immunoassay (Cambridge Biosciences Corporation, Worcester MA) has been used to resolve indeterminate Western blot results. The tests used have been described previously (21).

Data Analysis.

For completeness in assessing trends, three rates were used: the seropositive rate per 1,000 tested; the seroconversion rate per 1,000 tested; and the seroconversion rate per 1,000 person-years.

The seropositive rate per 1,000 tested was obtained by dividing the number of individuals who tested positive during a quarter by the number of individuals tested in that quarter, whether or not the individual had a negative test in the past. Only the first positive test was included.

The seroconversion rate per 1,000 tested was obtained by dividing the number of newly positive individuals who had a previous negative ELISA test by the number of individuals tested in that quarter who had a previous negative ELISA test or who joined the Navy after October, 1985, when a negative test became mandatory for entry into service. This rate was adjusted for age using the indirect method (33), and was used for detailed analysis of trends in population subgroups.

The seroconversion rate per 1,000 person-years was obtained by dividing the number of newly seropositive individuals by the number of person-years at risk. This rate was calculated to allow approximate comparisons of the results of this study with previous studies using person-years (21,30). The population at risk was defined as all active-duty enlisted personnel in the Navy during a quarter who had a negative ELISA test before or during the quarter (or who entered service after October, 1985), and had a subsequent negative or positive ELISA test. Each individual contributed person-time between that individual's first negative test and either their first positive or last negative test. With the person-years method, all persons who had a previous and subsequent negative ELISA test were included in the person-years denominator for an interval. Consequently, crude rates based on person-years were sensitive to the number of tests administered during an interval, which varied among quarters. Therefore, this rate was adjusted for the number of tests administered each quarter (34). Persons with two negative tests were assumed to be negative through the end of the study period.

Confounding factors and adjustment procedures. A number of demographic factors have been shown to be associated with HIV seropositivity, including age, race, sex, occupation, and geographic location (9,19,21,25,30,35-38). Because the Navy's testing cycle covers approximately two years, quarterly variation in rates may be due to differences in demographic or geographic characteristics of the population tested. To determine if the population tested varied by these factors, the percent distribution of each factor by quarter was determined.

Occupational risk group was determined by ranking individual occupations from lowest to highest seropositivity rates, and then dividing the list of occupations into quintiles. The percentage of individuals tested who were from each quintile was calculated for each quarter. In addition, hospital corpsmen, a high-risk occupational group with the largest number of HIV seropositive personnel, was analyzed separately. Indirect age-adjustment using age-specific Navy rates for the entire study-period combined as the standard was performed for seroconversion rates per 1,000 tested (33). Yearly mean rates were obtained by averaging the observed rates during the four quarters of each year. Statistical significance was assessed using 95 percent confidence intervals (33).

Population not tested. The population not tested was compared to the tested population by age, race, and sex, to determine if the tested population differed from the untested population.

Results

The number of individuals tested per quarter ranged from 57,559 in the first quarter of 1986 to 211,297 in the second quarter of 1988, with a mean of 112,224. A total of 1,795,578 ELISA tests were administered to 848,632 individuals over the study-period and 2,438 HIV seropositive individuals were identified (Figure 1, Table 1). The number of seropositive individuals identified per year declined from 1,197 in 1986 to 214 in 1989 (Table 1).

The proportion of the population tested by race, sex, and

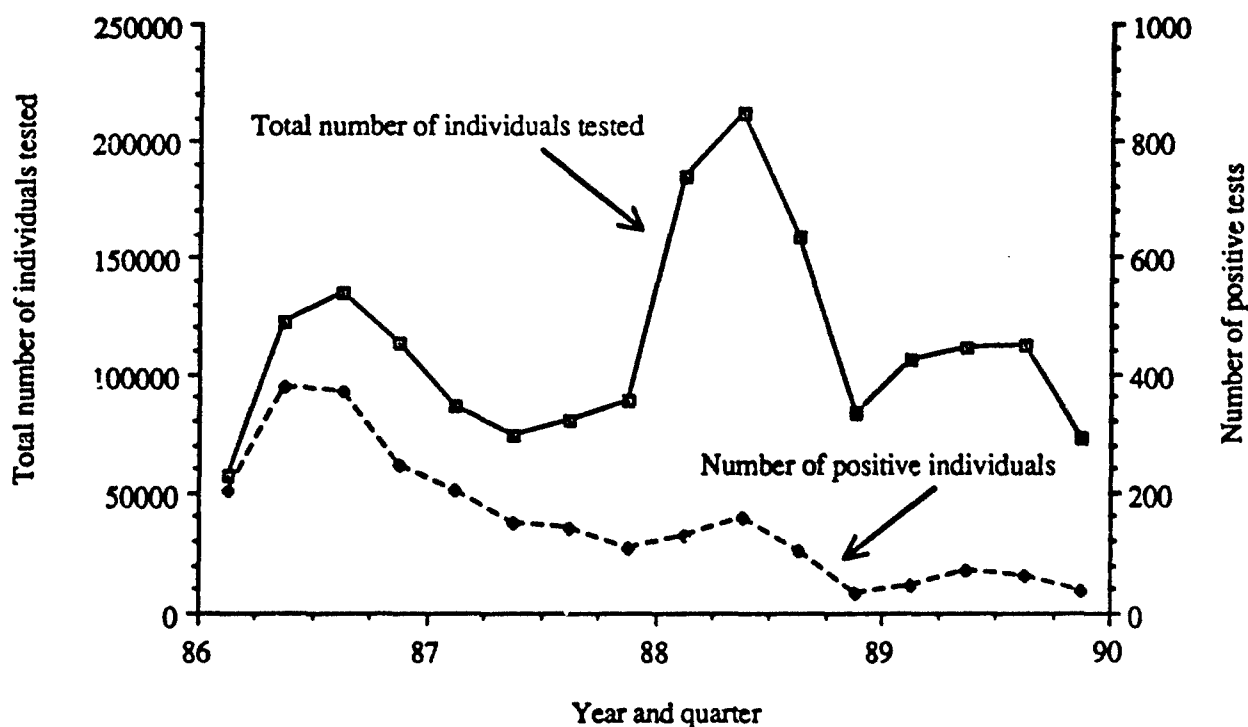


Figure 1. Number of individuals tested and number of HIV seropositive (Western blot confirmed) individuals identified, active-duty U.S. Navy enlisted personnel, 1986-1989

Table 1. Yearly mean seropositive and seroconversion rate per 1,000 population, active-duty U.S. Navy enlisted personnel, 1986-1989.

Year	Number of sero-positives	Seropositive rate per 1,000 tested	95% Confidence limits		Number of sero-converters	Age-adjusted seroconversion rate per 1,000 tested	95% Confidence limits		Seroconversion rate per 1,000 person years adjusted for number	95% Confidence limits	
			Lower	Upper			Lower	Upper		Lower	Upper
1986	1,197	2.9	2.7	3.1	69	3.4	2.7	4.3	0.9	0.7	1.1
1987	602	1.8	1.7	2.0	193	1.7	1.5	1.7	0.7	0.6	0.8
1988	425	0.6	0.5	0.7	328	0.6	0.5	0.7	0.4	0.4	0.4
1989	214	0.5	0.4	0.6	188	0.5	0.4	0.6	0.4	0.3	0.5
1986-1989	2,438	1.5	1.5	1.5	778	1.6	1.5	1.7	0.5	0.5	0.5

occupational risk group was similar in each quarter (Appendix Figures 1-3), although there were some differences according to age (Appendix Figure 4). Secular variations in the proportion of the population tested from home ports in high risk areas such as San Francisco could not account for the observed trends (Appendix Table 2).

The seropositive rate per 1,000 tested (Figure 2, Table 1, Appendix Table 1). This rate declined from 3.6 per 1,000 tested in the first quarter of 1986 to 0.5 per 1,000 tested in the last quarter of 1989, a statistically significant decrease ($p < 0.05$). The rate of decline was greatest from the first quarter of 1986 through the last quarter of 1987, after which the rate decreased only slightly. The mean annual rate declined from 2.9 in 1986 to 0.5 in 1989 ($p < 0.05$).

The seroconversion rate per 1,000 tested (Figure 2, Table 1, Appendix Table 3). This rate peaked at 5.7 per 1,000 during the second quarter of 1986, then declined to 2.5 per 1,000 in the next quarter, a non-significant difference. The rates plateaued until the third quarter of 1987. This was followed by a decrease to a relatively stable level throughout 1988 and 1989, reaching 0.5 per 1,000 in the fourth quarter of 1989, a statistically significantly ($p < 0.05$) lower HIV seroconversion rate than all quarterly rates in 1986 and 1987. The mean annual rate per 1,000 tested declined from 3.4 in 1986 to 0.5 in 1989

($p < 0.05$).

The seroconversion rate per 1,000 person-years (Figure 2, Table 1, Appendix Table 4). There was little detectable pattern by quarter in the person-years seroconversion rate. The mean annual rate in 1989, 0.4 per 1,000 person-years, was significantly lower ($p < 0.05$) than the mean annual rate of 0.9 in 1986. By 1989, the rates yielded by this method were approximately the same as those yielded by the other two methods.

Population sub-groups.

Race and ethnicity (Figure 3, Appendix Table 5). The mean age-adjusted seroconversion rate per 1,000 tested in blacks was statistically significantly ($p < 0.05$) higher than in whites in all 4 years. Due to a greater decline in rates in blacks than in whites, the black to white ratio of yearly mean age-adjusted rates decreased from 3.9 in 1986 to 2.7 in 1989.

Combined seroconversion rates in individuals of race or ethnicity other than white or black (i.e., Oriental, Philippino, and American Indian) were similar to those of blacks in the first quarter of the study, but approximated those of whites from the first quarter of 1988 until the end of the study.

Men and women (Figure 4, Appendix Table 6). The age-adjusted seroconversion rates for women were based on 1 or 2 cases in each quarter, except for the second quarter of 1988,

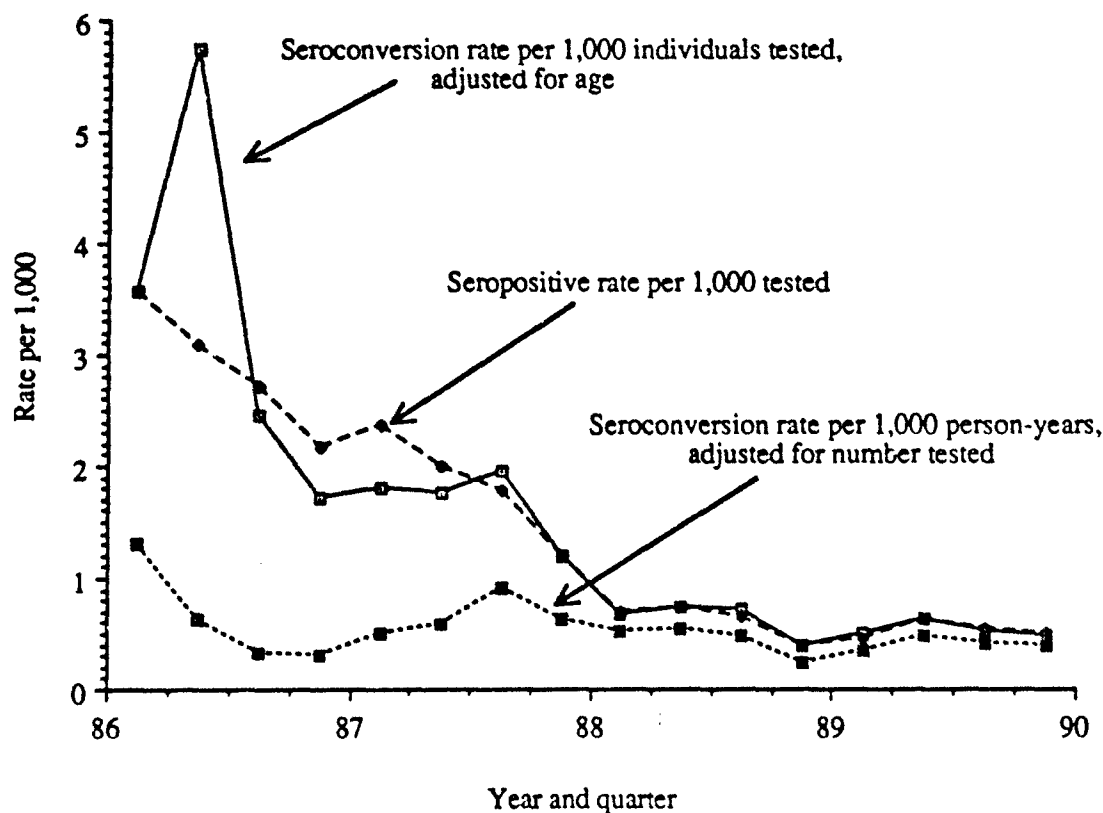


Figure 2. Seropositive and seroconversion rates, by quarter, active-duty U.S. Navy enlisted personnel, 1986-1989

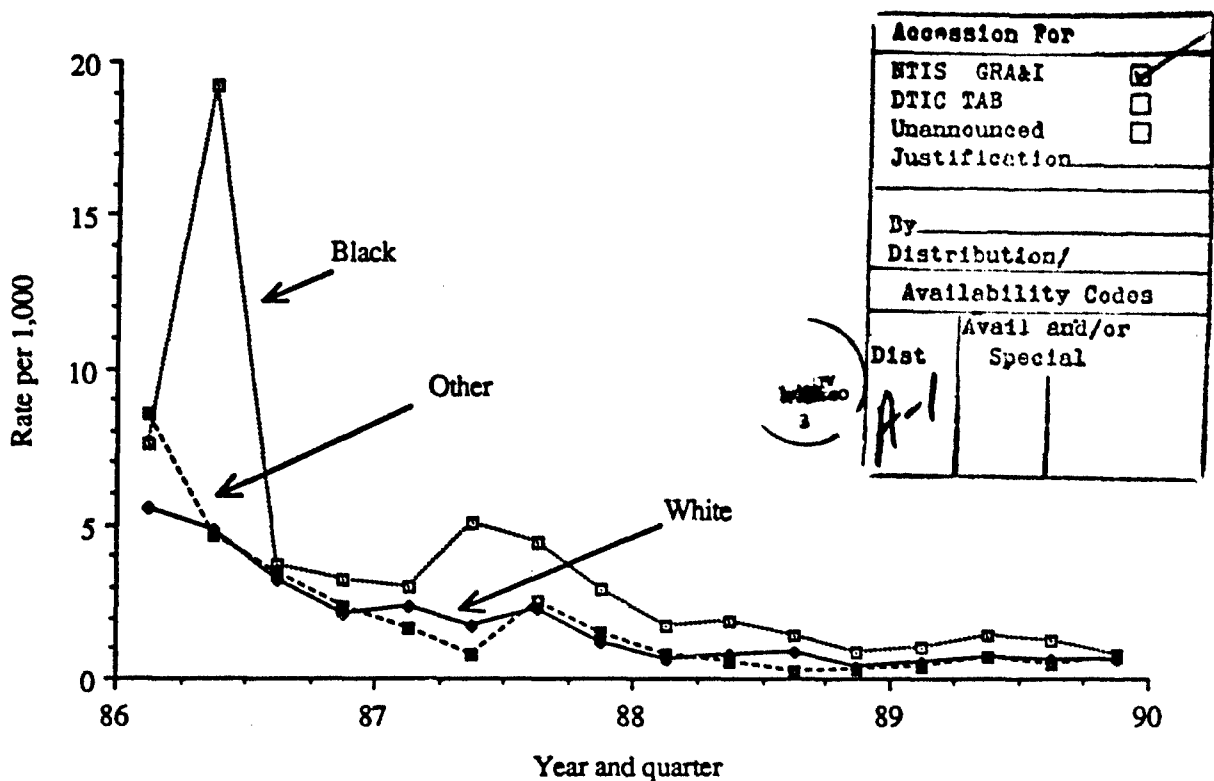


Figure 3. HIV seroconversion rate per 1,000 individuals tested, by race, adjusted for age, active-duty U.S. Navy enlisted personnel, 1986-1989

which was based on 3 cases. The age-adjusted seroconversion rate of 4.4 in the second quarter of 1986 was not statistically significantly higher than the seroconversion rate of 0.7 in the first quarter of 1987, a rate approximately one-third that of men. The rate in women declined during the fourth quarter of 1987, after which it remained relatively stable at 0.1 - 0.2 per 1,000 tested. There were no seroconversions in 8,490 women tested in the third quarter of 1989. Seroconversion rates were not reported for the first quarter of 1986 due to the small denominator (N = 13).

Age (Figure 5, Appendix Table 7). A steep decline in rates occurred in persons 30 years of age or older between the first and third quarters of 1986. The high rate in this age group in the first quarter of 1986 (29.4 per 1,000) was statistically significantly higher than the rates in all quarters after the second quarter of that year, and higher than rates in all other age-groups except ages 25-29 years in the second quarter of 1986. By the second quarter of 1986, the differences between age-groups were no longer statistically significant.

Hospital corpsmen (Figure 6, Appendix Table 8). The occupation of hospital corpsman had the largest number of HIV seropositive personnel and a high overall HIV seropositivity rate and was analyzed separately. The mean yearly age-adjusted seroconversion rate in hospital corpsmen in 1989

(1.6 per 1,000 tested) was statistically significantly higher ($p < 0.05$) than the mean seroconversion rate for all Navy active-duty enlisted personnel during that year (0.5 per 1,000 tested).

Male hospital corpsmen accounted for 97 of 98 hospital corpsmen who seroconverted, and had a higher seroconversion rate (2.2 per 1,000 tested) than female hospital corpsmen (0.1 per 1,000 tested) ($p < 0.05$) (not shown). Approximately 80 percent of hospital corpsmen tested were male. A statistically significant decline in seroconversion rates was present in hospital corpsmen as in the total Navy, with the largest proportion of the decline occurring at the beginning of the study.

Untested population (Appendix Table 9). Ninety-nine percent of the active-duty Navy enlisted population received an ELISA test during the study period. The untested population (N = 4,108) was 86.2 percent women (compared to 10.0 percent women in the total Navy enlisted population). The youngest age group and oldest age groups were both over-represented in the untested population. The occupations of seaman, yeoman, personnelman, and storekeeper were over-represented in the untested population; hospital corpsmen were not.

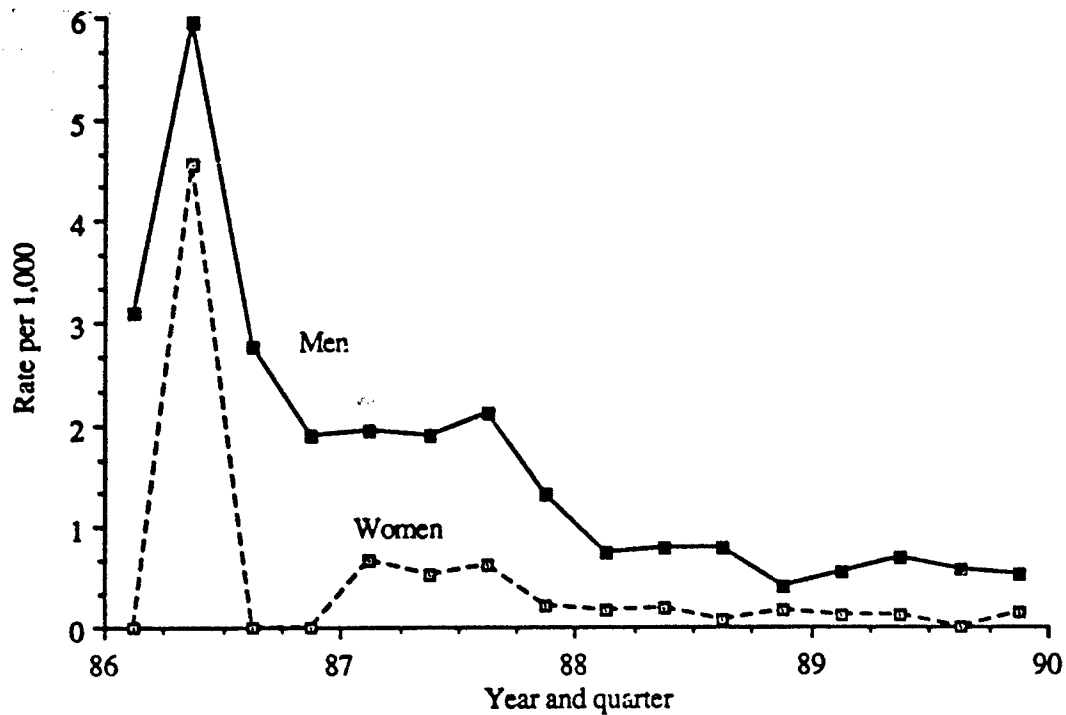


Figure 4. HIV seroconversion rate per 1,000 individuals tested with a previous negative test, active-duty U.S. Navy enlisted personnel, by sex, 1986-1989

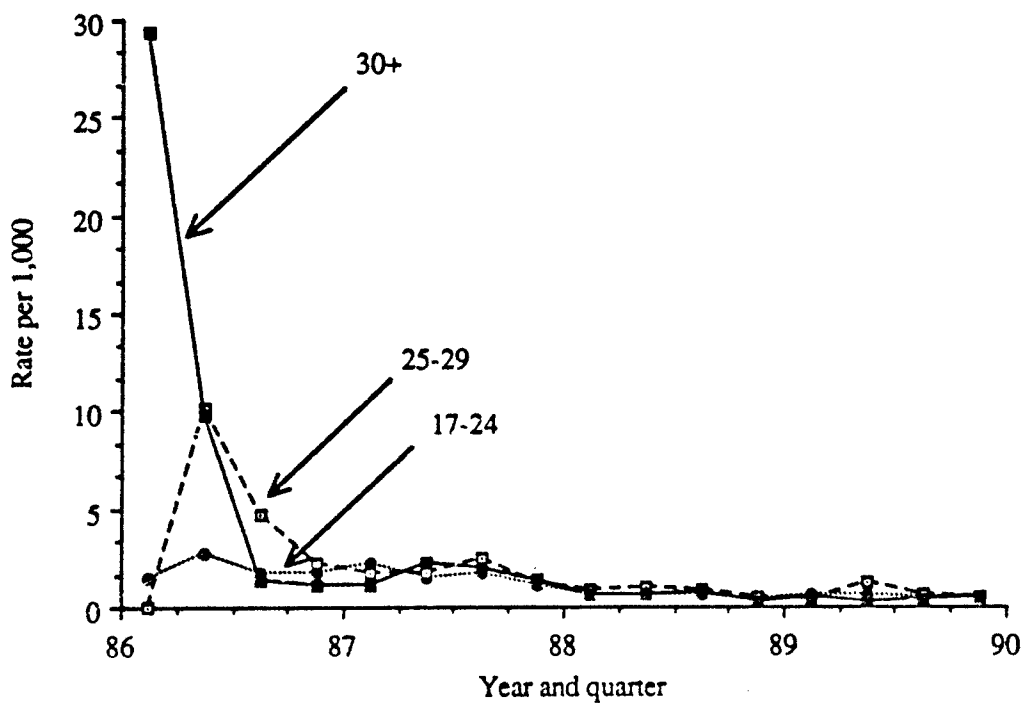


Figure 5. HIV seroconversion rate per 1,000 individuals tested by age, active-duty U.S. Navy enlisted personnel, 1986-1989

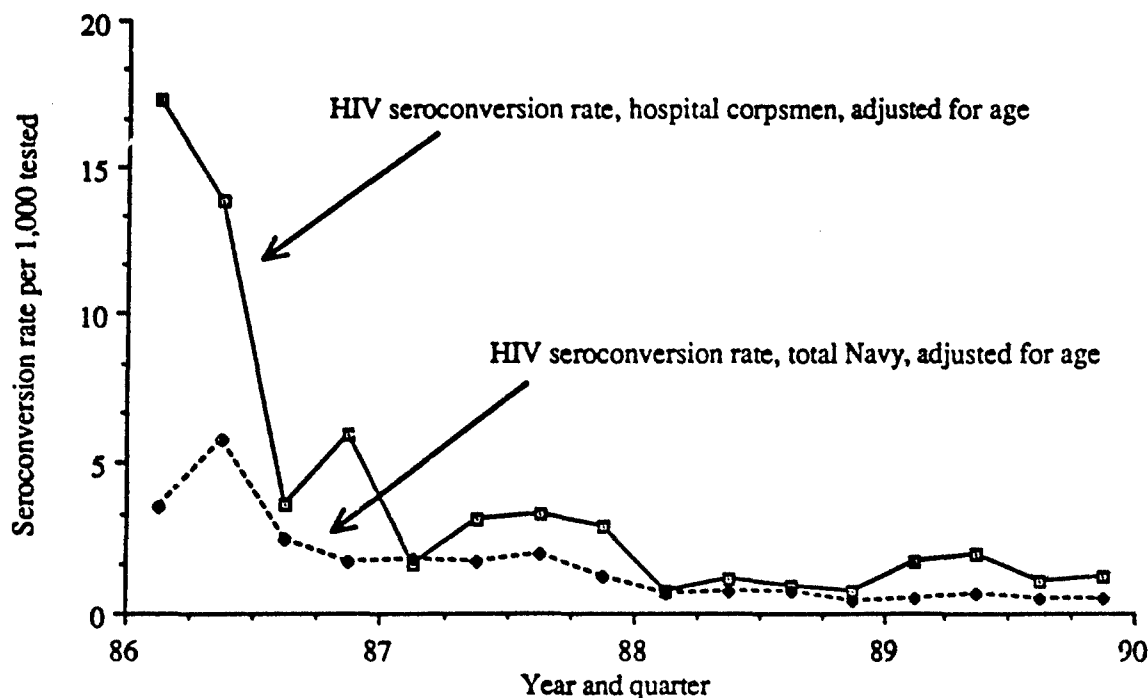


Figure 6. HIV seroconversion rate per 1,000 individuals tested, adjusted for age, hospital corpsman, and total Navy, active-duty U.S. Navy enlisted personnel, 1986-1989

Discussion

Overall Time Trends.

Each of the analytic methods used in this study provided a unique view of HIV seropositivity in the Navy, and each has strengths and weaknesses which complement the other. Taken as a whole, they provide a more complete picture of the pattern of occurrence of HIV infection in the Navy which no single method adequately provides.

All three types of HIV seropositivity rates among active-duty enlisted personnel declined from 1986 to 1989. The seropositive rate per 1,000 tested and the seroconversion rate per 1,000 tested showed a marked decline. The seroconversion rate per 1,000 person-years showed a more moderate decline. The rates obtained using these methods converged over the study-period until quarterly rates yielded by each method were similar by 1989.

Rates for high-risk age, race, sex, and occupational groups declined at a faster rate than those of lower risk groups, and consequently, the difference in rates between high-risk groups and total Navy rates became less apparent over the study-period.

Rate of seropositives per 1,000 tested. Rates declined from 3.6 per 1,000 tested in the first quarter of 1986 to 0.5 in the last quarter of 1989. Rates calculated using this method were least sensitive to the possibility that the highest risk individuals might have been tested before 1986 and conse-

quently may have been more likely to have a negative test on file when the study began.

Seroconversion rate per 1,000 tested. Age-adjusted quarterly HIV seroconversion rates per 1,000 tested with a previous negative test showed a more variable trend. Some of the variation might have occurred because relatively fewer individuals had a previous negative test during the early quarters, possibly resulting in lower precision during these quarters.

The pattern of quarterly HIV seroconversion rates per 1,000 tested may be suggestive of the tail of an epidemic curve (39-41) in men, which may have peaked in or prior to 1986. An epidemic curve may also be present in women. The pattern of the seropositive rate per 1,000 tested is also suggestive of the tail of an epidemic curve.

Seroconversion rate per 1,000 person-years. The absence of a strong trend in HIV seroconversion rates per 1,000 person-years may be partly explained by the nature of these rates.

The quarterly denominators used for this method included persons not tested during a particular quarter but who had a negative test before and after the quarter. This made the rate subject to variation according to the number of tests performed in a quarter; however, this variation was taken into account by adjustment for the number of tests performed in a quarter. Nonetheless, this characteristic blunts differences between quarterly rates

Artifactual considerations.

Population tested. The overall decline in rates seen in the

three methods is unlikely to be due to a change in the population tested, as the rates were age-adjusted and the population tested did not vary importantly according to distribution of race, sex, and occupational risk-groups tested in each quarter. New York, San Francisco, and Washington, DC were high-risk areas for HIV seropositivity in military recruits (26) but the proportion of the population tested from such high-risk areas was not over-represented during the periods of peaks in HIV rates, making the location of testing unlikely to have importantly affected quarterly rates.

Testing procedures. While there was a change in suppliers of ELISA test kits at the end of 1986, there were no notable changes in seroconversion rates per 1,000 tested between the quarter immediately preceding and that following the change in suppliers.

Untested population. The untested population was small (less than 1 percent). It was heavily over-represented by women, which may be a reflection of less perceived need for testing of women. There were some differences between the age distribution of the total Navy and the untested population, but no consistent trend was apparent as both the youngest and oldest ages were over-represented in the untested population. While the possibility exists that some high-risk older men, who might have been more knowledgeable in methods of avoiding testing, were excluded, there is little evidence that this could have occurred at a magnitude that would have had an important effect on rates of seropositivity or seroconversion.

Detailed Time-Trends.

Rates were markedly higher in blacks than in whites and other races in the early study-period. This finding is consistent with previous studies which have shown higher rates in blacks (21,28,30). Rates in blacks remained higher than whites throughout the study, although the magnitude of the difference declined over time.

The primary HIV epidemic was in men; only 17 of 778 seroconverters were women. The overall male to female ratio of age-adjusted seroconversion rates per 1,000 tested for the study period was 3.2. A consistent pattern of HIV seroconversion in women did not appear until the first quarter of 1987 and had the appearance of an epidemic curve, despite the small number of women who seroconverted.

The major differences in rates among the three age groups during the first three quarters of 1986 disappeared by the last quarter of 1988. Since 1987, rates in all three age groups have been similar. The decline in the seroconversion rate in personnel aged 30 years and older cannot be explained on the basis of exclusion from the Navy of seropositive recruits, as there are many fewer recruits in this age group than at younger ages, where the decline was less dramatic.

HIV seroconversion rates in hospital corpsmen declined over the study-period, but were generally higher than total Navy rates. HIV infection in this group was not likely due to occupational exposures as rates were high in male but not female hospital corpsmen.

A similar testing program to the one reported here is the testing program for military applicants (26,27). Although

they are not directly comparable, the observed rate of 0.5 seropositives per 1,000 white male civilian applicants for military service in 1988 did not differ markedly from the rate of 0.6 seropositives per 1,000 active-duty Navy personnel during that year.

Risk factors.

There is currently no detailed information regarding trends in the Navy in behavior such as high-risk sexual activities and intravenous drug use, so the reasons for the decrease in HIV seroconversion rates in the Navy are speculative. National educational campaigns and Navy sponsored educational programs (41) may have succeeded in reducing high-risk behaviors in Navy personnel and in reducing the spread of HIV in the Navy.

Comparison with other populations.

Most other studies of trends have been limited to high-risk groups, such as gay or bisexual men (8-12), intravenous drug users (43-45), and prisoners (13-16), which are presumably not similar to the Navy population in prevalence of risk factors. Rates in these populations have been reported to be much higher than the rates reported here.

The relatively low seropositive rate and seroconversion rate (0.5 per 1,000 tested for both) in the Navy in 1989 may be approaching a general population background rate. This rate is somewhat higher than a rate of 0.32 per 1,000 hospital patients reported in a Centers for Disease Control sentinel study of approximately 9,000 patients in four mid-western hospitals (20), but less than a rate of 0.8 positives per 1,000 tested in approximately 11,000 heterosexual women enrolled in prenatal and family planning clinics in 10 states (1).

As true prevalence of HIV seropositivity declines, the rate of false positive tests can be expected to rise (33). As a consequence, the rate observed late in the study may include some false positives, a factor which may warrant further attention.

Several cautions must be considered regarding the generalization of the trends found in the Navy to other populations. The Navy is not representative of the greater U.S. population in many factors including its age and sex structure. Because of the requirement beginning in October, 1985, of a negative ELISA test for entrance into the military, there has been systematic selection of seronegative individuals, decreasing the potential population of HIV carriers in the Navy. Knowledge of this requirement may also have led to self-deferral from application to the Navy of seronegative persons with high-risk behaviors, decreasing the likelihood of seroconversion following entrance into the Navy. The Navy specifically prohibits high-risk behavior such as intravenous drug use and same-sex sexual activity. On the other hand, the military services are heavily weighted toward a young, single, mobile population that is presumably sexually active.

Summary

Three methods for the investigation of overall time trends in identification of HIV seropositive enlisted personnel in the U.S. Navy indicate a decline in the occurrence of HIV infec-

tion in Navy personnel since the second quarter of 1986. The percent decline from 1986 to 1989 varied by method: -83 percent according to the rate of seropositives per 1,000 individuals tested; -85 percent according to the seroconversion rate per 1,000 tested; and -56 percent according to the seroconversion rate per 1,000 person-years. Since initial screening began, the rates yielded by the three methods have converged.

The decline reported here in HIV seropositivity rates is encouraging. How much this reflects the pattern in the general population or rather a pattern imposed on the Navy population by the rigorous policies of testing and exclusion of HIV seropositive individuals from military service requires comparisons with other populations in less restricted settings.

The declining magnitude of HIV seropositivity does not suggest there will be a declining rate of clinically apparent AIDS cases in the Navy over the next decade. Intensive efforts to meet the coming needs for treatment in the Navy and the general population are essential.

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Appendix Table 1. Number of individuals tested, number of HIV seropositives, and seropositive rates per 1,000 tested, by quarter, active-duty U.S. Navy enlisted personnel, 1986-1989.

Year and quarter	Population tested*	Number of sero- positives	Seropositive rate per 1,000 tested	95% Confidence limits	
				Lower	Upper
1986					
1	57,559	205	3.6	3.1	4.1
2	122,892	379	3.1	2.8	3.4
3	135,262	368	2.7	2.5	3.0
4	112,783	245	2.2	1.9	2.5
1987					
1	86,116	204	2.4	2.1	2.7
2	74,034	149	2.0	1.7	2.4
3	79,988	143	1.8	1.5	2.1
4	88,010	106	1.2	1.0	1.5
1988					
1	184,931	128	0.7	0.6	0.8
2	211,297	159	0.8	0.6	0.9
3	158,355	105	0.7	0.5	0.8
4	83,344	33	0.4	0.3	0.6
1989					
1	105,423	47	0.4	0.3	0.6
2	111,086	69	0.6	0.5	0.8
3	111,994	61	0.5	0.4	0.7
4	72,504	37	0.5	0.4	0.7
Total	1,795,578	2,438			
Mean			1.5	1.5	1.5

* 848,632 individuals were tested. The total shown here is larger because individuals who were negative could be tested 2 or more times during the study period.

Appendix Table 2. Percent distribution of population tested for HIV seropositivity, by home port, by quarter, active-duty U.S. Navy enlisted personnel, 1986-1989 -- *continued*.

Area	1988					1989				
	1	2	3	4	Mean	1	2	3	4	Mean
Boston	0.5	0.4	0.3	0.3	0.4	0.4	0.8	0.3	0.2	0.4
Brunswick	0.6	0.6	0.7	0.4	0.6	0.4	0.5	0.7	0.8	0.6
Charleston	4.5	5.0	3.1	4.5	4.3	6.1	6.3	5.9	6.1	6.1
Chicago	2.5	1.9	4.2	9.4	4.5	5.7	3.5	5.6	4.8	4.9
Jacksonville	6.3	3.9	3.2	4.3	4.4	4.2	3.3	4.2	5.9	4.4
Long Beach	4.7	5.1	2.9	3.7	4.1	3.2	5.8	5.5	3.7	4.6
Miami	0.7	0.7	0.2	0.6	0.6	0.5	0.3	0.3	0.4	0.4
New London	4.8	1.9	1.4	2.9	2.8	3.5	2.8	2.4	2.0	2.7
New Orleans	4.1	3.9	3.1	4.4	3.9	3.1	3.2	2.9	3.2	3.1
New York	0.2	0.3	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1
Newport	0.9	0.8	1.1	1.0	0.9	1.3	0.8	0.8	0.5	0.8
Norfolk	13.4	14.1	19.7	14.7	15.4	16.9	16.1	12.7	14.5	15.0
Overseas Atlantic	3.0	4.2	3.3	2.1	3.2	4.3	4.8	2.5	3.6	3.8
Overseas Pacific	7.3	5.4	4.7	6.1	5.9	5.2	6.0	4.5	8.6	6.1
Pearl Harbor	4.0	4.2	5.1	2.8	4.0	3.8	6.4	5.9	4.3	5.1
Philadelphia	1.9	2.1	2.0	1.7	1.9	1.9	1.8	1.6	1.7	1.7
San Diego	12.7	14.9	13.7	11.6	13.2	13.9	18.4	14.7	14.9	15.6
San Francisco	6.7	8.3	9.0	6.2	7.6	6.5	5.5	10.9	5.7	7.1
Seattle	3.9	4.3	3.5	2.2	3.5	2.6	2.5	4.2	3.6	3.2
Washington	0.6	1.2	0.9	1.1	0.9	1.1	0.6	0.6	0.8	0.8
Unknown	16.7	17.1	17.7	19.9	17.7	15.3	10.6	13.8	14.5	13.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Appendix Table 2. Percent distribution of population tested for HIV seropositivity, by home port, by quarter, active-duty U.S. Navy enlisted personnel, 1986-1989 -- *continued.*

Area	1988				1989			
	1	2	3	4	1	2	3	4
				Mean				Mean
Boston	0.5	0.4	0.3	0.3	0.4	0.8	0.3	0.4
Brunswick	0.6	0.6	0.7	0.4	0.6	0.4	0.5	0.6
Charleston	4.5	5.0	3.1	4.5	4.3	6.1	6.3	6.1
Chicago	2.5	1.9	4.2	9.4	4.5	5.7	3.5	4.8
Jacksonville	6.3	3.9	3.2	4.3	4.4	4.2	3.3	4.4
Long Beach	4.7	5.1	2.9	3.7	4.1	3.2	5.8	3.7
Miami	0.7	0.7	0.2	0.6	0.6	0.5	0.3	0.4
New London	4.8	1.9	1.4	2.9	2.8	3.5	2.8	2.0
New Orleans	4.1	3.9	3.3	4.4	3.9	3.1	3.2	3.2
New York	0.2	0.3	0.1	0.2	0.2	0.2	0.1	0.1
Newport	0.9	0.8	1.1	1.0	0.9	1.3	0.8	0.8
Norfolk	13.4	14.1	19.7	14.7	15.4	16.9	16.1	14.5
Overseas Atlantic	3.0	4.2	3.3	2.1	3.2	4.3	4.8	3.6
Overseas Pacific	7.3	5.4	4.7	6.1	5.9	5.2	6.0	8.6
Pearl Harbor	4.0	4.2	5.1	2.8	4.0	3.8	6.4	4.3
Philadelphia	1.9	2.1	2.0	1.7	1.9	1.9	1.8	1.7
San Diego	12.7	14.9	13.7	11.6	13.2	13.9	18.4	14.9
San Francisco	6.7	8.3	9.0	6.2	7.6	6.5	5.5	5.7
Seattle	3.9	4.3	3.5	2.2	3.5	2.6	2.5	3.6
Washington	0.6	1.2	0.9	1.1	0.9	1.1	0.6	0.8
Unknown	16.7	17.1	17.7	19.9	17.7	15.3	10.6	14.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Appendix Table 3. Number of individuals tested with a previous negative test, number of HIV seroconverters, and crude and age-adjusted seroconversion rates per 1,000 by quarter, active-duty U.S. Navy enlisted personnel, 1986-1989.

Year and quarter	Population with a previous negative test	Number of seroconverters	Crude seroconversion		95% Confidence limits		Age-adjusted seroconversion rate per 1,000 tested		95% Confidence limits	
			rate per 1,000 tested	Lower	Upper	rate per 1,000 tested	Lower	Upper		
1986										
1	1,946	7	3.6	1.4	7.4	3.6	1.4	7.4		
2	3,248	19	5.8	3.5	9.1	5.7	3.5	9.0		
3	7,949	20	2.5	1.5	3.9	2.5	1.5	3.8		
4	13,203	23	1.7	1.1	2.6	1.7	1.1	2.6		
1987										
1	17,905	33	1.8	1.3	2.6	1.8	1.2	2.5		
2	21,432	38	1.8	1.3	2.4	1.8	1.2	2.4		
3	34,058	67	2.0	1.5	2.5	2.0	1.5	2.5		
4	45,422	55	1.2	0.9	1.6	1.2	0.9	1.6		
1988										
1	139,360	96	0.7	0.6	0.8	0.7	0.6	0.8		
2	165,881	123	0.7	0.6	0.9	0.7	0.6	0.9		
3	119,538	86	0.7	0.6	0.9	0.7	0.6	0.9		
4	60,233	23	0.4	0.2	0.6	0.4	0.2	0.6		
1989										
1	81,139	41	0.5	0.4	0.7	0.5	0.4	0.7		
2	94,315	60	0.6	0.5	0.8	0.6	0.5	0.8		
3	100,521	53	0.5	0.4	0.7	0.5	0.4	0.7		
4	70,358	34	0.5	0.3	0.7	0.5	0.3	0.7		
Total	976,508	778	1.6	1.5	1.7	1.6	1.5	1.7		
Mean										

Appendix Table 4. Number of person-years at risk, number of HIV seroconverters, and crude and test-adjusted* seroconversion rates per 1,000 person-years, by quarter, active-duty U.S. Navy enlisted personnel, 1986-1989.

Year and quarter	Person-years at risk during quarter	Crude sero-conversion rate		Number tested in quarter	Adjustment factor †	Seroconversion rate per 1,000 person-years, adjusted for the number of tests	95% Confidence limits	
		Number of seroconverters	per 1,000 person-years				Lower	Upper
1986								
1	10,502	7	0.7	57,559	1.9	1.3	0.5	2.7
2	27,676	19	0.7	122,892	0.9	1.6	0.4	1.0
3	51,709	20	0.4	135,262	0.8	0.3	0.2	0.5
4	73,745	23	0.3	112,783	1.0	0.3	0.2	0.5
1987								
1	86,134	33	0.4	86,116	1.3	0.5	0.3	0.7
2	96,695	38	0.4	74,034	1.5	0.6	0.4	0.8
3	103,546	67	0.6	79,988	1.4	0.9	0.7	1.2
4	109,418	55	0.5	88,010	1.3	0.7	0.5	0.8
1988								
1	113,353	96	0.8	184,931	0.6	0.5	0.4	0.6
2	120,040	123	1.0	211,297	0.5	0.5	0.5	0.6
3	126,980	86	0.7	158,355	0.7	0.5	0.4	0.6
4	130,058	23	0.2	83,344	1.3	0.2	0.2	0.4
1989								
1	128,663	41	0.3	105,423	1.1	0.4	0.2	0.5
2	129,526	60	0.5	111,086	1.0	0.5	0.4	0.6
3	131,169	53	0.4	111,994	1.0	0.4	0.3	0.5
4	132,379	34	0.3	72,504	1.5	0.4	0.3	0.6
Total	1,571,593	778		1,795,578				
Mean			0.5		1.0	0.5	0.5	0.5

* Adjusted for the number of tests given each quarter.

† Mean quarterly number of tests for the entire period (n = 112,224) divided by the number of tests administered in the quarter.

Appendix Table 5. Number of individuals tested with a previous negative test, number of HIV seroconverters, and crude and age-adjusted HIV seroconversion rates per 1,000 tested, by race, by quarter, active-duty U.S. Navy enlisted personnel, 1986-1989.

Year and quarter	Population with a previous negative test	Number of seroconverters	White						
			Crude seroconversion rate per 1,000 tested	95% Confidence limits		Age-adjusted seroconversion rate per 1,000 tested	95% Confidence limits		
				Lower	Upper		Lower	Upper	
1986									
1	1,570	4	2.5	0.7	6.5	2.5	0.7	6.4	
2	2,488	7	2.8	1.1	5.8	2.8	1.1	5.8	
3	6,063	13	2.1	1.1	3.7	2.1	1.1	3.6	
4	10,217	14	1.4	0.7	2.3	1.3	0.7	2.2	
1987									
1	13,745	22	1.6	1.0	2.4	1.6	1.0	2.4	
2	16,839	20	1.2	0.7	1.8	1.2	0.7	1.8	
3	26,637	38	1.4	1.0	2.0	1.4	1.0	1.9	
4	34,345	29	0.8	0.6	1.2	0.8	0.5	1.2	
1988									
1	108,639	51	0.5	0.3	0.6	0.5	0.4	0.7	
2	129,183	67	0.5	0.4	0.7	0.5	0.4	0.7	
3	92,126	55	0.6	0.5	0.8	0.6	0.4	0.8	
4	46,115	13	0.3	0.2	0.5	0.3	0.2	0.5	
1989									
1	63,023	25	0.4	0.3	0.6	0.4	0.3	0.6	
2	72,940	34	0.5	0.3	0.7	0.5	0.3	0.7	
3	77,804	29	0.4	0.3	0.5	0.4	0.3	0.6	
4	53,666	21	0.4	0.2	0.6	0.4	0.2	0.6	
Total	755,400	442	1.1	1.0	1.2	1.1	1.0	1.2	
Mean									

Appendix Table 5. Number of individuals tested with a previous negative test, number of HIV seroconverters, and crude and age-adjusted HIV seroconversion rates per 1,000 tested, by race, by quarter, active-duty U.S. Navy enlisted personnel, 1986-1989 --
continued.

Year and quarter	Population with a previous negative test	Number of seroconverters	Black			
			Crude seroconversion		Age-adjusted seroconversion	
			rate per 1,000 tested	95% Confidence limits Lower Upper	rate per 1,000 tested	95% Confidence limits Lower Upper
1986						
1	263	2	7.6	0.9 27.5	7.6	0.9 27.3
2	554	11	19.9	9.9 35.5	19.2	9.6 34.4
3	1,318	5	3.8	1.2 8.8	3.7	1.2 8.6
4	2,134	7	3.3	1.3 6.8	3.2	1.3 6.6
1987						
1	2,946	9	3.1	1.4 5.8	3.0	1.4 5.7
2	3,294	17	5.2	3.0 8.3	5.1	3.0 8.1
3	5,424	24	4.4	2.8 6.6	4.4	2.8 6.5
4	7,435	22	3.0	1.9 4.5	2.9	1.8 4.4
1988						
1	21,563	38	1.8	1.2 2.4	1.7	1.2 2.4
2	25,591	50	2.0	1.5 2.6	1.9	1.4 2.5
3	19,924	29	1.5	1.0 2.1	1.4	1.0 2.1
4	10,821	9	0.8	0.4 1.6	0.8	0.4 1.6
1989						
1	13,259	14	1.1	0.6 1.8	1.1	0.6 1.8
2	15,422	22	1.4	0.9 2.2	1.4	0.9 2.2
3	16,438	21	1.3	0.8 2.0	1.3	0.8 2.0
4	12,296	10	0.8	0.4 1.5	0.8	0.4 1.5
Total	158,682	290	3.8	3.3 4.3	3.8	3.3 4.3
Mean						

Appendix Table 5. Number of individuals tested with a previous negative test, number of HIV seroconverters, and crude and age-adjusted HIV seroconversion rates per 1,000 tested, by race, by quarter, active-duty U.S. Navy enlisted personnel, 1986-1989 --
continued.

Year and quarter	Population with a previous negative test	Number of sero-converters	Other races					
			Crude sero-conversion rate per 1,000 tested	95% Confidence limits		Age-adjusted seroconversion rate per 1,000 tested	95% Confidence limits	
				Lower	Upper		Lower	Upper
1986	113	1	8.9	0.2	49.3	8.6	0.2	47.7
1	206	1	4.9	0.1	27.0	4.7	0.1	27.1
2	568	2	3.5	0.4	12.7	3.5	0.4	12.5
3	852	2	2.3	0.3	8.5	2.3	0.3	8.5
4								
1987	1,214	2	1.6	0.2	5.9	1.6	0.2	5.9
1	1,299	1	0.8	0.0	4.3	0.8	0.0	4.3
2	1,997	5	2.5	0.8	5.8	2.5	0.8	5.9
3	2,642	4	1.5	0.4	3.9	1.5	0.4	3.9
4								
1988	9,158	7	0.8	0.3	1.6	0.8	0.3	1.6
1	11,101	6	0.5	0.2	1.2	0.6	0.2	1.2
2	7,488	2	0.3	0.0	1.0	0.3	0.0	1.0
3	3,297	1	0.3	0.0	1.7	0.3	0.0	1.7
4								
1989	4,857	2	0.4	0.1	1.5	0.4	0.1	1.5
1	5,953	4	0.7	0.2	1.7	0.7	0.2	1.7
2	6,279	3	0.5	0.1	1.4	0.5	0.1	1.4
3	4,396	3	0.7	0.1	2.0	0.7	0.1	2.0
4								
Total	61,420	46	1.9	1.4	2.5	1.9	1.4	2.5
Mean								

Appendix Table 6. Number of individuals tested with a previous negative test, number of HIV seroconverters, and crude and age-adjusted HIV seroconversion rates per 1,000 tested by sex, by quarter, active-duty U. S. Navy enlisted personnel, 1986-1989 --
continued.

Year and quarter	Population with a previous negative test	Number of seroconverters	Women					
			Crude seroconversion rate per 1,000 tested	95% Confidence limits		Age-adjusted seroconversion rate per 1,000 tested	95% Confidence limits	
				Lower	Upper		Lower	Upper
1986								
1*	13	1	--	--	--	--	--	--
2	219	1	4.6	0.1	25.4	4.4	0.1	24.2
3	702	0	0.0	0.0	0.0	0.0	0.0	0.0
4	1,017	0	0.0	0.0	0.0	0.0	0.0	0.0
1987								
1	1,470	1	0.7	0.0	3.8	0.7	0.0	3.6
2	1,899	1	0.5	0.0	2.9	0.5	0.0	2.8
3	3,249	2	0.6	0.1	2.2	0.6	0.1	2.2
4	4,768	1	0.2	0.0	1.2	0.2	0.0	1.1
1988								
1	12,041	2	0.2	0.0	0.6	0.2	0.0	0.6
2	15,599	3	0.2	0.0	0.6	0.2	0.0	0.5
3	12,348	1	0.1	0.0	0.5	0.1	0.0	0.4
4	6,093	1	0.2	0.0	0.9	0.2	0.0	0.9
1989								
1	8,087	1	0.1	0.0	0.7	0.1	0.0	0.7
2	8,534	1	0.1	0.0	0.7	0.1	0.0	0.6
3	8,490	0	0.0	0.0	0.0	0.0	0.0	0.0
4	7,057	1	0.1	0.0	0.8	0.1	0.0	0.8
Total	91,586	17	0.5	0.3	0.8	0.5	0.3	0.8
Mean								

Appendix Table 6. Number of individuals tested with a previous negative test, number of HIV seroconverters, and crude and age-adjusted HIV seroconversion rates per 1,000 tested by sex, by quarter, active-duty U. S. Navy enlisted personnel, 1986-1989 --
continued.

Year and quarter	Women											
	Population with a previous negative test	Number of sero- converters	Crude sero- conversion rate per 1,000 tested	95% Confidence limits		Age-adjusted seroconversion rate per 1,000 tested	95% Confidence limits					
				Lower	Upper		Lower	Upper				
1986												
1*	13	1	--	--	--	--	--	--	--	--	--	
2	219	1	4.6	0.1	25.4	4.4	0.1	0.1	0.1	0.1	24.2	
3	702	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4	1,017	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
1987												
1	1,470	1	0.7	0.0	3.8	0.7	0.0	0.0	0.0	0.0	3.6	
2	1,899	1	0.5	0.0	2.9	0.5	0.0	0.0	0.0	0.0	2.8	
3	3,249	2	0.6	0.1	2.2	0.6	0.1	0.1	0.1	0.1	2.2	
4	4,768	1	0.2	0.0	1.2	0.2	0.0	0.0	0.0	0.0	1.1	
1988												
1	12,041	2	0.2	0.0	0.6	0.2	0.0	0.0	0.0	0.0	0.6	
2	15,599	3	0.2	0.0	0.6	0.2	0.0	0.0	0.0	0.0	0.5	
3	12,348	1	0.1	0.0	0.5	0.1	0.0	0.0	0.0	0.0	0.4	
4	6,093	1	0.2	0.0	0.9	0.2	0.0	0.0	0.0	0.0	0.9	
1989												
1	8,087	1	0.1	0.0	0.7	0.1	0.0	0.0	0.0	0.0	0.7	
2	6,534	1	0.1	0.0	0.7	0.1	0.0	0.0	0.0	0.0	0.6	
3	8,490	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4	7,057	1	0.1	0.0	0.8	0.1	0.0	0.0	0.0	0.0	0.8	
Total	91,586	17	0.5	0.3	0.8	0.5	0.3	0.3	0.3	0.3	0.8	
Mean												

Appendix Table 7. Number of individuals tested with a previous negative test, number of HIV seroconverters, and age-specific HIV seroconversion rates per 1,000 tested, by age, by quarter, active-duty U.S. Navy enlisted personnel, 1986-1989.

Year and quarter	Ages 17-24 years					Ages 25-29 years					Ages 30+ years				
	Population with a previous negative test	Number of sero-converters	Crude sero-conversion rate per 1,000 tested	95% Confidence limits		Population with a previous negative test	Number of sero-converters	Crude sero-conversion rate per 1,000 tested	95% Confidence limits		Population with a previous negative test	Number of sero-converters	Crude sero-conversion rate per 1,000 tested	95% Confidence limits	
				Lower	Upper				Lower	Upper				Lower	Upper
1986															
1	1,335	2	1.5	0.2	5.4	441	0	0.0	0.0	0.0	170	5	29.4	9.5	68.5
2	1,855	5	2.7	0.9	6.3	881	9	10.2	4.7	19.4	512	5	9.8	3.2	22.8
3	4,103	7	1.7	0.7	3.5	2,348	11	4.7	2.3	8.4	1,498	2	1.3	0.2	4.8
4	6,718	12	1.8	0.9	3.1	3,658	8	2.2	0.9	4.3	2,827	3	1.1	0.2	3.9
1987															
1	8,516	19	2.2	1.3	3.5	5,025	9	1.8	0.8	3.4	4,364	5	1.2	0.4	2.7
2	9,785	15	1.5	0.9	2.5	5,682	10	1.8	0.9	3.2	5,965	13	2.2	1.2	3.7
3	17,159	30	1.8	1.2	2.5	8,125	20	2.5	1.5	3.8	8,774	17	1.9	1.1	3.1
4	20,963	22	1.1	0.7	1.7	11,561	15	1.3	0.7	2.1	12,898	17	1.3	0.8	2.1
1988															
1	58,882	40	0.7	0.5	0.9	37,228	30	0.8	0.5	1.2	43,250	26	0.6	0.4	0.9
2	71,531	45	0.6	0.5	0.8	42,858	45	1.1	0.8	1.4	51,492	33	0.6	0.4	0.9
3	57,227	36	0.6	0.4	0.9	28,257	25	0.9	0.6	1.4	34,054	24	0.7	0.5	1.1
4	30,322	12	0.4	0.2	0.7	12,532	6	0.5	0.2	1.0	17,379	5	0.3	0.1	0.7
1989															
1	37,024	22	0.6	0.4	0.9	18,525	7	0.4	0.2	1.8	25,590	12	0.5	0.2	0.8
2	45,594	26	0.6	0.4	0.8	21,072	26	1.2	0.8	1.8	27,648	8	0.3	0.1	0.6
3	53,203	29	0.6	0.4	0.8	21,536	14	0.7	0.4	1.1	25,782	10	0.4	0.2	0.7
4	34,919	16	0.5	0.3	0.7	15,615	8	0.5	0.2	1.0	19,824	10	0.5	0.2	0.9
Total	459,136	339	1.2	1.1	1.3	235,345	244	1.9	1.6	2.2	282,027	195	3.2	2.7	3.7
Mean															

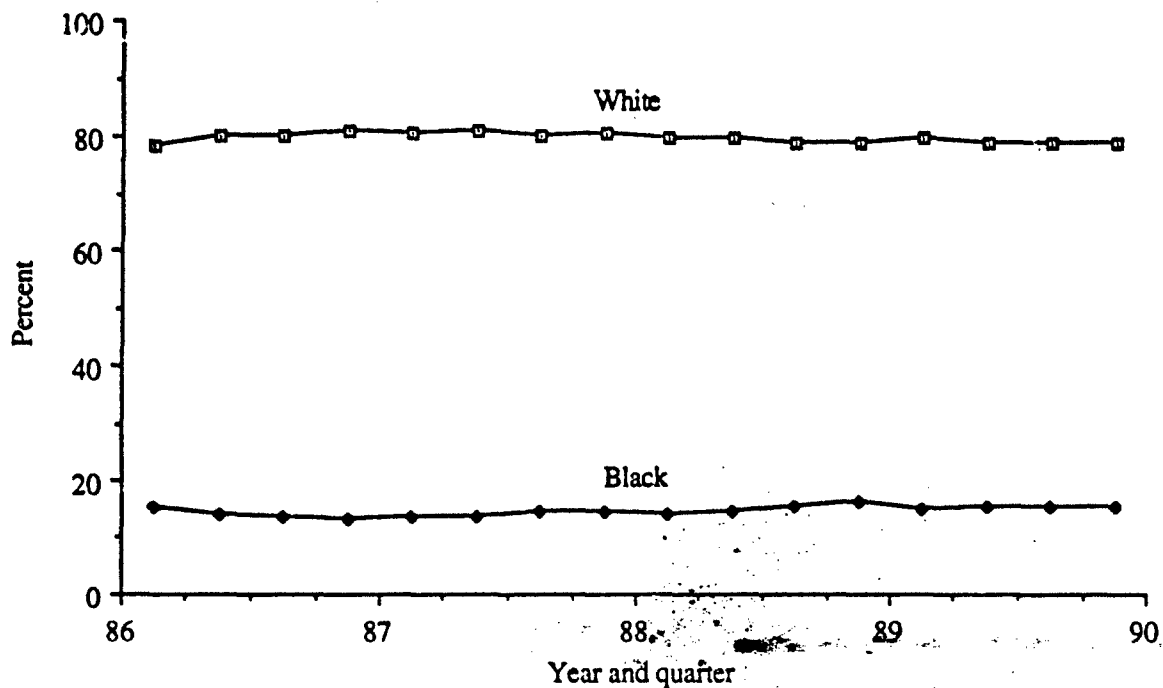
Appendix Table 8. Number of individuals tested with a previous negative test, number of HIV seroconverters, and crude and age-adjusted HIV seroconversion rates, hospital corpsmen, by quarter, active-duty U.S. Navy, 1986-1989.

Year and quarter	Population with a previous negative test	Number of seroconverters	Crude seroconversion		95% Confidence limits		Age-adjusted seroconversion rate per 1,000 tested		95% Confidence limits	
			rate per 1,000 tested	rate per 1,000 tested	Lower	Upper	rate per 1,000 tested	rate per 1,000 tested	Lower	Upper
1986										
1	116	2	17.2	17.2	2.1	62.2	17.2	17.2	2.1	62.2
2	142	2	14.1	14.1	3.8	36.1	13.9	13.9	3.8	35.5
3	527	2	3.8	3.8	0.1	8.3	3.6	3.6	1.3	7.8
4	822	5	6.1	6.1	3.0	10.9	6.0	6.0	3.0	10.7
1987										
1	1,202	2	1.7	1.7	0.9	2.8	1.6	1.6	0.9	2.8
2	1,584	5	3.2	3.2	1.9	5.0	3.1	3.1	1.9	5.0
3	2,695	9	3.3	3.3	2.2	4.9	3.3	3.3	2.2	4.8
4	3,075	9	2.9	2.9	2.1	4.1	2.9	2.9	2.0	4.0
1988										
1	9,360	7	0.7	0.7	0.5	1.0	0.7	0.7	0.5	1.0
2	8,719	10	1.1	1.1	0.9	1.5	1.1	1.1	0.9	1.5
3	6,826	6	0.9	0.9	0.7	1.1	0.9	0.9	0.7	1.1
4	4,149	3	0.7	0.7	0.6	0.9	0.7	0.7	0.6	0.9
1989										
1	6,213	11	1.2	1.2	0.9	1.5	1.8	1.8	1.4	2.2
2	6,099	12	2.0	2.0	1.6	2.5	2.0	2.0	1.6	2.5
3	5,526	6	1.1	1.1	0.9	1.3	1.1	1.1	0.9	1.3
4	5,562	7	1.3	1.3	1.0	1.5	1.3	1.3	1.0	1.5
Total	62,617	98	3.8	3.8	3.1	4.6	3.8	3.8	3.1	4.6
Mean										

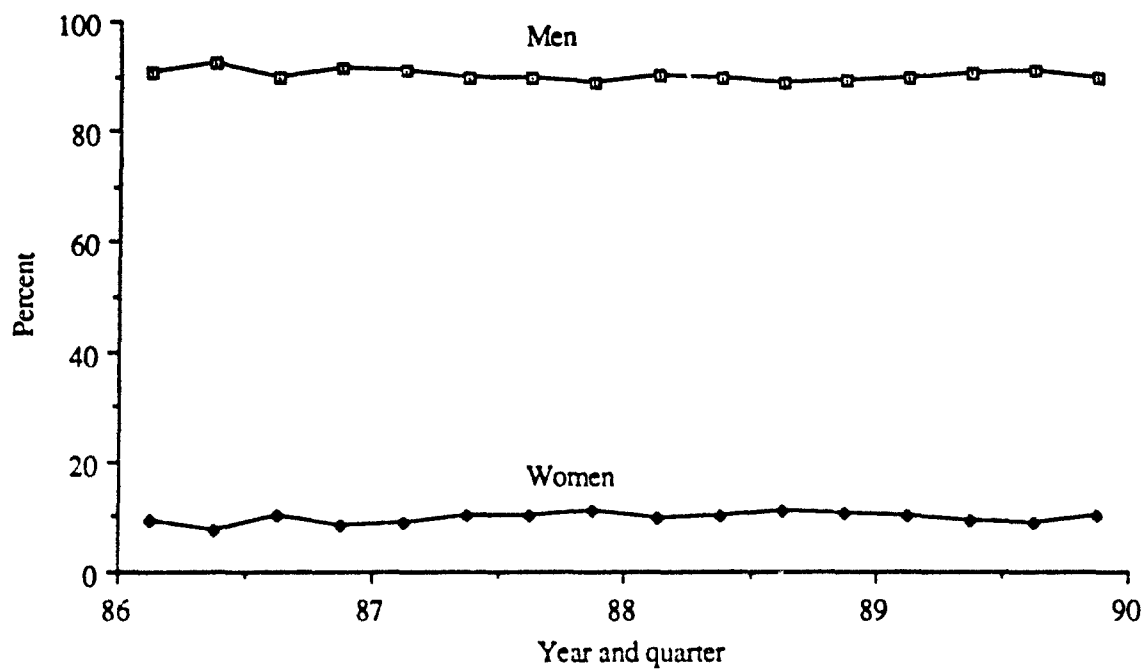
Appendix Table 9. Number and percent distribution of personnel who have never had an ELISA test, and the total active-duty U.S. Navy enlisted population by sex, race, age, and occupation, as of August 1990.

Characteristic	Untested population		Active-duty population	
	Number	Percent	Number	Percent
Sex				
Men	565	13.8	467,521	90.0
Women	3,543	86.2	51,818	10.0
Total	4,108	100.0	519,339	100.0
Race				
Caucasian	3,128	76.1	396,359	76.3
Black	690	16.8	90,812	17.5
Malayan	137	3.3	13,018	2.5
Other	122	3.0	16,769	3.2
American Indian	20	0.5	2,158	0.4
Unknown	11	0.3	223	
Total	4,108	100.0	519,339	100.0
Age in years				
17-19	982	23.9	53,366	10.6
20-24	847	20.6	198,592	38.3
25-29	706	17.2	116,690	22.5
30-34	631	15.4	74,340	14.3
35-39	521	12.7	48,644	9.3
40+	416	10.2	27,610	5.0
Unknown	5	0.3	97	
Total	4,108	100.0	519,339	100.0
Occupation*				
Seaman	765	18.6	42,574	8.2
Yeoman	221	5.3	13,173	2.5
Hospital corpsman	167	4.1	27,257	5.2
Personnelman	132	3.3	6,958	1.2
Storekeeper	120	2.9	11,056	2.1
All other	2,703	65.8	101,018	82.9
Total	4,108	100.0	519,339	100.0

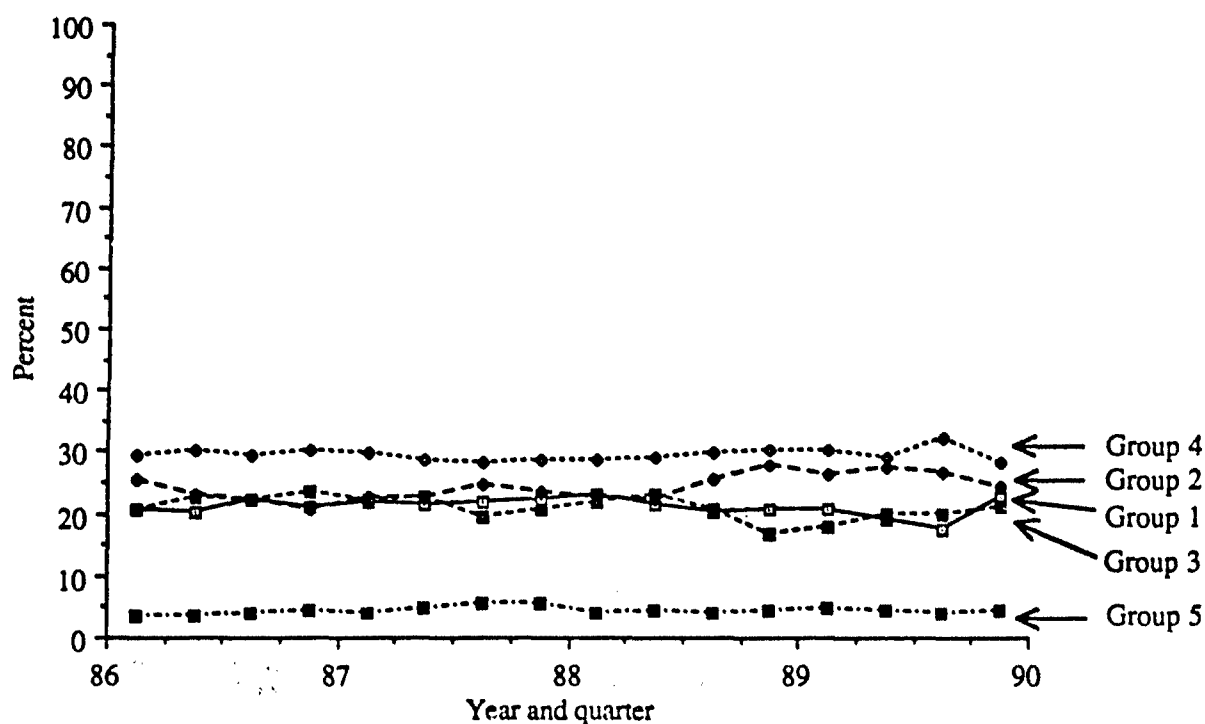
* The five occupations with the largest number of untested personnel and all other occupations.



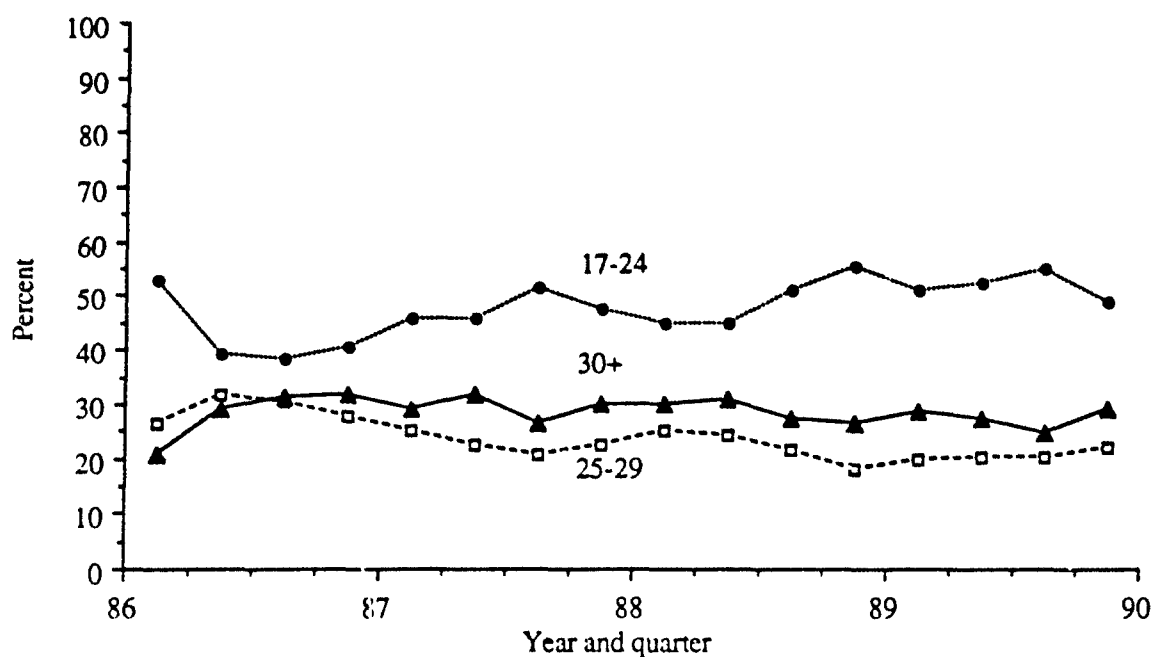
Appendix Figure 1. Percent distribution of population tested for HIV seropositivity, by racial group and quarter, active-duty U.S. Navy enlisted personnel, 1986-1989



Appendix Figure 2. Percent distribution of men and women among individuals tested for HIV seropositivity, by quarter active-duty U.S. Navy enlisted personnel, 1986-1989



Appendix Figure 3. Percent distribution of population tested for HIV seropositivity, by occupational risk group and quarter, active-duty U.S. Navy enlisted personnel, 1986-1989



Appendix Figure 4. Percent distribution of population tested for HIV seropositivity, by age group and quarter, active-duty U.S. Navy enlisted personnel, 1985-1989

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13. ABSTRACT (Maximum 200 words) Time-trends in the occurrence of HIV seropositivity are the basis for projecting the future course of the epidemic. This study presents quarterly rates of HIV infection during 1986 to 1989 in U.S. Navy active-duty enlisted personnel, a large, serially-tested population. During this period, the U.S. Navy administered 1,795,578 enzyme-linked immunosorbent assay (ELISA) tests to 848,632 active-duty Navy enlisted personnel. There were 2,438 seropositive personnel identified, including 778 with a previous negative test. Three types of quarterly rates are reported here: the seropositive rate per 1,000 tested; the seroconversion rate per 1,000 tested (with a previous negative test); and the seroconversion rate per 1,000 person-years. Rates by all three methods declined between 1986 and 1989. The mean seropositive rate per 1,000 tested showed a steady decline from 2.9 in 1986 to 0.5 in 1989 ($p < 0.05$). The mean age-adjusted seroconversion rate per 1,000 tested declined from 3.4 in 1986 to 0.5 in 1989 ($p < 0.05$). The mean seroconversion rate per 1,000 person-years declined from 0.9 in 1986 to 0.4 in 1989 ($p < 0.05$). The race ratio (black/white) declined from 3.9 to 2.7 over the same time-period. Mean seroconversion rates among male hospital corpsmen declined from 10.3 in 1986 to 1.5 in 1989 ($p < 0.05$). The overall decline in HIV rates in the Navy could not be explained by changes in the population tested according to age, race, sex, occupational risk group, or geographic location of home port during the study period. The decline in rates in the Navy is encouraging. The trend may reflect a pattern imposed on this population by rigorous testing and exclusion of HIV seropositive individuals from entrance into service. Despite the decline in seroconversion, the majority of AIDS cases in the Navy may yet occur.				
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